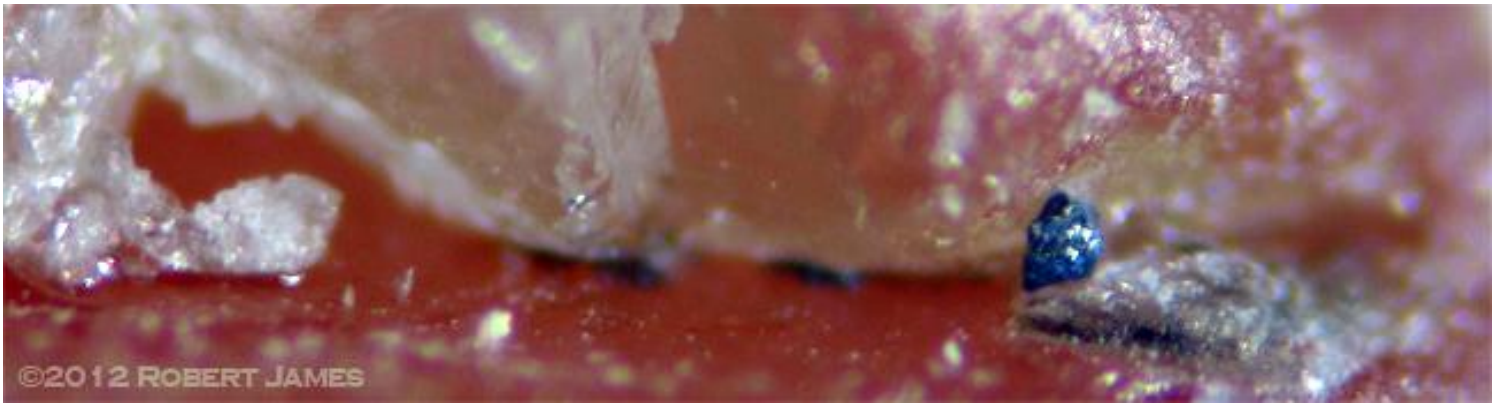


Crucible Relics on Chinese Andesine

Robert James
International School of Gemology

In November 2008, Jackie Li of the Tibet Sunstone Mine refused to sell any rough uncut Tibet Sunstone crystals from what was then claimed to be her family's Tibet sunstone mine. The response to the request was simply stated: "We don't sell rough" (email from Jackie Li, 2008).

In his expedition report of 2009, Dr. Ahmadjan Abduriyim then of the Gemmological Association of All Japan (GAAJ)-Zenhokyo Laboratory, reported that the Inner Mongolian andesine mine produced over 100 tons of rough yellow andesine per year while the Tibet andesine mine produced up to 800 kilograms of copper bearing rough per year. But even as the television shopping channels were selling faceted Tibet andesine at an estimated value of over US$150+ million…. not one piece of rough Inner Mongolian or Tibet andesine was available on the market.

In the report of his expedition to the Inner Mongolian and Tibet mines in 2011, Richard W. Hughes of Sino Resources Mining Corporation of Hong Kong, and formerly of GemsTV, reported that no rough Inner Mongolian andesine was available because the Inner Mongolian mine had closed due to lack of market demand. During this same time the gem feldspar miners in Mexico reported that Chinese dealers were buying virtually the full production of the mines in Mexico and shipping it to China.

At every step of this Chinese andesine saga, the lack of rough andesine on the market has been a carefully manipulated story that has served to deflect attention away from one of the most critical factors in any gemstone mine claim: testing of the rough. Obtaining rough crystals from a mine allows the material to be tested and verified as natural and untreated. The validity of the mine claim can be verified based on testing of the rough it produces.

This is why we believe that no Chinese andesine rough has been available on the open market, because it would expose the material to testing and review. Since one company, Andegem, has been verified by court documents as the supplier of andesine to the television shopping channels, we believe that Andegem was originally able to control the distribution of the treated rough. However, as the market grew and Andegem lost some of their control of the material, the ability to reach out to these dealers to obtain rough finally allowed testing and review of the rough.

Over the past 4 years we have had the opportunity to collect rough from two critical entities involved in Chinese andesine: Litto Gems and King Star. Both of these organizations were represented in the various Tibet and Inner Mongolian andesine expeditions, and are referred to in the various reports as selling natural untreated andesine. Since 2009 we have collected over 50 specimens of rough Chinese andesine directly from these companies. Some of those specimens can be seen at left from this image of rough Chinese andesine specimens in our office.

Below are images of me and Lisa Brooks-Pike of the JEA receiving specimens from Mr. Ming of King Star. Also below is the card from Litto Gems from their shipment to the ISG office of scores of specimens sent to us for testing.

In spite of having these specimen groups, until 2012 we were missing the most critical specimens from the Abduriyim and Hughes expeditions. While we performed advanced testing on the King Star and Litto Gems rough, there was still no rough available from the reported expeditions of Dr. Abduriyim and Richard W. Hughes.

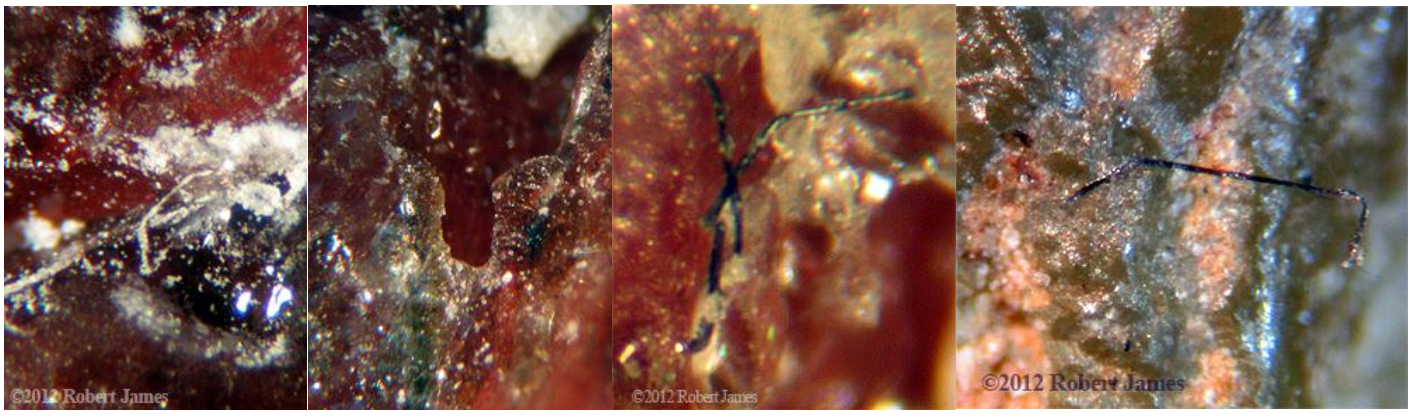
This changed at the Tucson Gem Shows in 2012 when a joint discussion panel was held specifically by Abduriyim and Hughes at which they personally handed out specimens that they personally guaranteed to be natural, untreated specimens of Chinese andesine. We now had a complete study set.

Testing and Comparison of the Abduriyim/Hughes Specimens

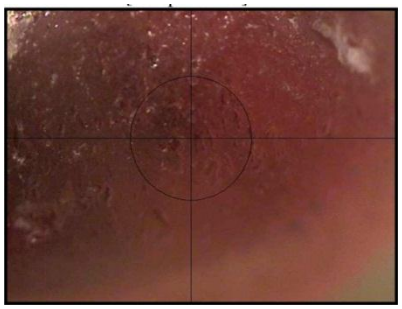
Using our Meiji Techno microscopes, Enwave Raman, and other more basic gemological testing we found these rough specimens to offer the same basic reactions as the previously tested Chinese andesine that was faceted.

The rough Chinese andesine from Litto Gems, King Star, and the Abduriyim/Hughes expeditions all presented the same Raman scan as the faceted specimens, which also included being exactly the same as the known yellow feldspar from Casa Grande, Mexico as previously tested. The surface features of the rough from the newly acquired Abduriyim/Hughes specimens were identical to the previously collected specimens from Litto Gems and King Star. A comparison of these is below showing high magnification images taken over the period of 2009 - 2012. Note the glassy surface glaze and strange threads embedded in the glaze.

Litto Gems | **King Star** | **Abduriyim/Hughes Tibet and Inner Mongolian**

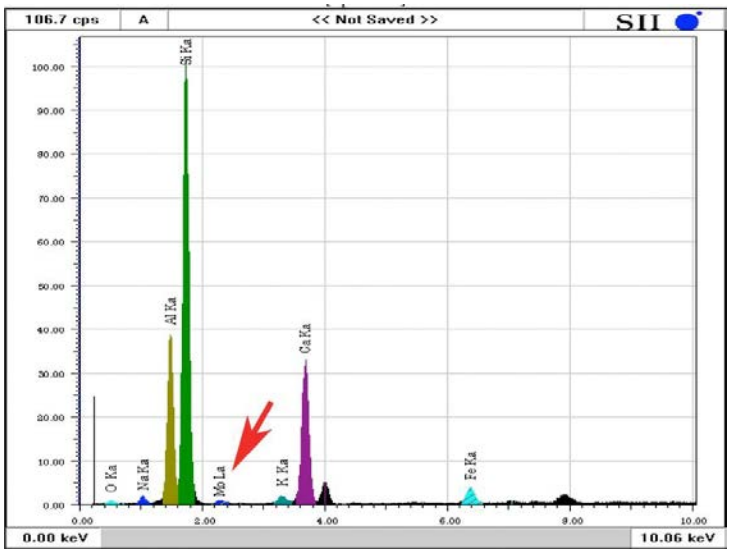


In order to get a truly accurate and unbiased evaluation on these specimens we commissioned independent scientific laboratories to perform advanced elemental analysis of these specimens. We utilized FAI Materials Testing of Marietta, GA for SEM EDXS, and Oneida Research Services of Whitesboro, NY for XRF testing.

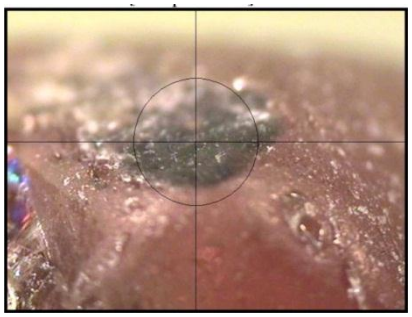


We first tested the plain red surface of one of the Litto Gems stones. The image you see at left is from the actual XRF test showing the area tested. .

Below is the actual test result report. The first element that we noted which was unexpected and out of place was the molybdenum.

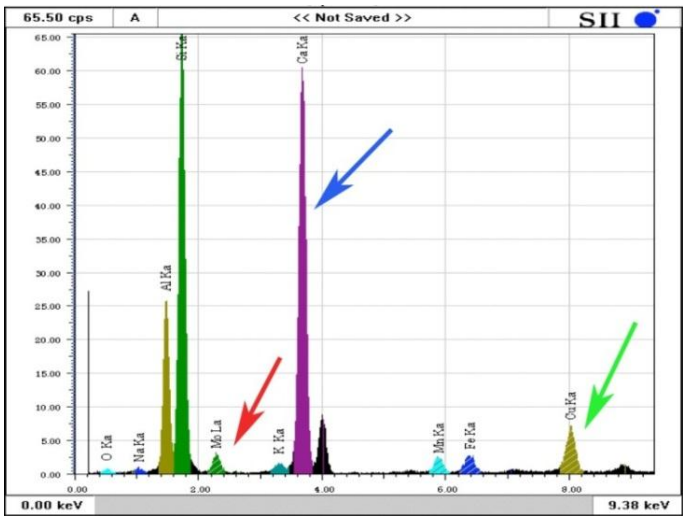


Z	Elem	Elem Name	Line	A cps	ROI keV
8	O	Oxygen	Ka	16.368	0.41- 0.64
11	Na	Sodium	Ka	31.085	0.92- 1.16
13	Al	Aluminum	Ka	607.585	1.36- 1.61
14	Si	Silicon	Ka	1575.959	1.61- 1.87
19	K	Potassium	Ka	47.420	3.17- 3.46
20	Ca	Calcium	Ka	598.701	3.54- 3.84
26	Fe	Iron	Ka	89.915	6.23- 6.57
42	Mo	Molybdenum	La	21.510	2.16- 2.43

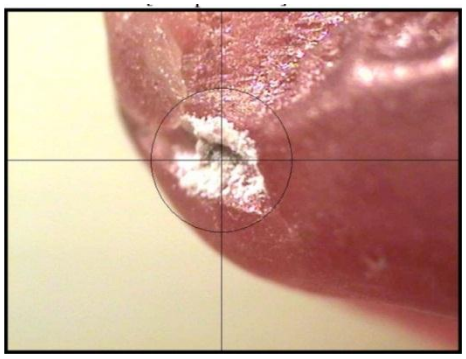


Oneida next tested a burnt looking area of what appears to be blackened glass. The actual test area is shown at left with the results shown below.

In this blackened area we found exceptionally high levels of calcium, but also found the addition of high copper content and once again…..molybdenum.

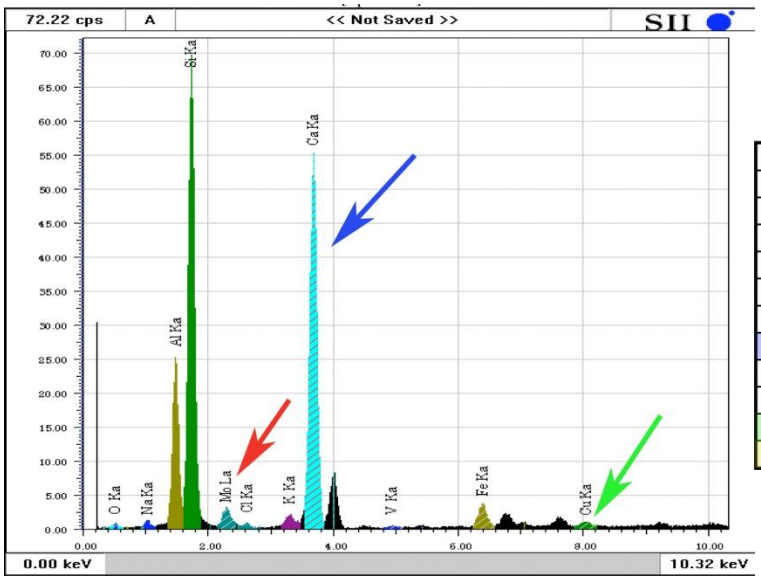


Z	Elem	Elem Name	Line	A cps	ROI keV
8	O	Oxygnen	Ka	14.875	0.41- 0.64
11	Na	Sodium	Ka	18.661	0.92- 1.16
13	Al	Aluminum	Ka	413.007	1.36- 1.61
14	Si	Silicon	Ka	1054.478	1.61- 1.87
19	K	Potassium	Ka	41.194	3.17- 3.46
20	Ca	Calcium	Ka	1082.732	3.54- 3.84
25	Mn	Manganese	Ka	59.865	5.73- 6.06
26	Fe	Iron	Ka	72.818	6.23- 6.57
29	Cu	Copper	Ka	169.185	7.86- 8.22
42	Mo	Molybdenum	La	56.661	2.16- 2.43

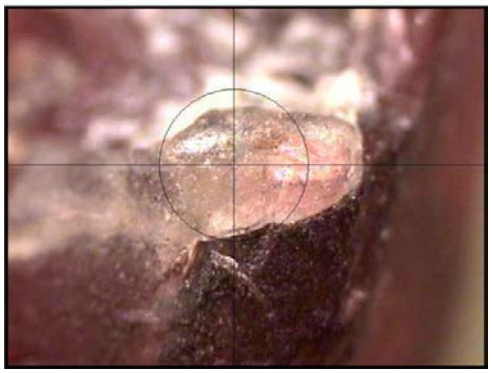


And finally, the white crusty area that has become synonymous with this Chinese andesine rough. This glazed white crust that is highly reactive to fluorescent light has been found on all claimed specimens of Chinese andesine from both Tibet and Inner Mongolia.

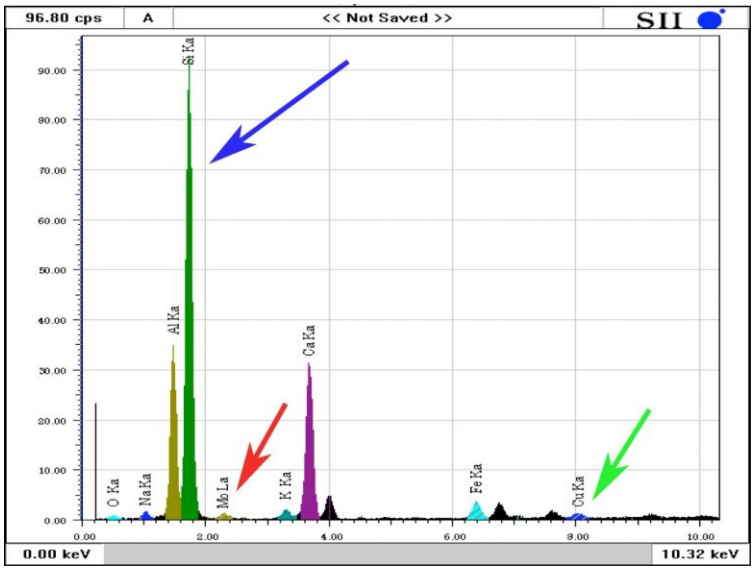
And once again, we found high concentrations of calcium as well as copper and molybdenum. The presence of copper in the white crust and burned areas was not a surprise since we anticipated that this would be a relic of treatment that would be found on the surface of this rough. But the molybdenum was a surprise as it has been omitted or else overlooked by all previous Abduriyim reports.



Z	Elem	Elem Name	Line	A cps	ROI keV
8	O	Oxygen	Ka	14.794	0.41- 0.64
11	Na	Sodium	Ka	22.511	0.92- 1.16
13	Al	Aluminum	Ka	388.788	1.36- 1.61
14	Si	Silicon	Ka	1091.972	1.61- 1.87
17	Cl	Chlorine	Ka	19.843	2.48- 2.76
19	K	Potassium	Ka	50.548	3.17- 3.46
20	Ca	Calcium	Ka	1007.404	3.54- 3.84
23	V	Vanadium	Ka	13.114	4.79- 5.11
26	Fe	Iron	Ka	85.000	6.23- 6.57
29	Cu	Copper	Ka	33.322	7.86- 8.22
42	Mo	Molybdenum	La	65.916	2.16- 2.43



The glassy glaze material did not show the high calcium content, but rather showed greatly increased silicon content. However, the presence of copper and molybdenum was still recorded on this feature as it was on all other surface features of this Chinese andesine.



Z	Elem	Elem Name	Line	A cps	ROI keV
8	O	Oxygen	Ka	15.089	0.41- 0.64
11	Na	Sodium	Ka	29.482	0.92- 1.16
13	Al	Aluminum	Ka	536.799	1.36- 1.61
14	Si	Silicon	Ka	1423.342	1.61- 1.87
19	K	Potassium	Ka	45.444	3.17- 3.46
20	Ca	Calcium	Ka	572.328	3.54- 3.84
26	Fe	Iron	Ka	80.783	6.23- 6.57
29	Cu	Copper	Ka	36.948	7.86- 8.22
42	Mo	Molybdenum	La	26.980	2.16- 2.43

Due to the totally surprising nature of the molybdenum find, we wanted to double check these results in order to be as accurate as possible. To do this we applied the following standards:

1. Took a totally different specimen set from the Litto Gems and King Star specimen collection,
2. Cut the specimens open to be able to test the exterior surface and the interior crystal structure.
3. Went to a totally different and unrelated independent scientific laboratory,
4. Used a totally different method of testing…in this case a scanning electron microscope. SEM EDXS

The results: Totally the same….except we also found molybdenum inside the Chinese andesine crystals. Below is the read out of the test showing the presence of molybdenum both on the surface and inside the andesine rough crystals. All tests performed by both labs presented the same result: There is molybdenum all over and inside these specimens

.

Table 1: SEM EDXS Elemental Analysis (Weight %)

Sample	Surface	Run	C	O	Na	Al	Si	Cl	K	Ca	Mo	Fe	Ni
Litto Gems	Interior	1	8.4	45.3	3.9	13.0	22.4	<0.1	0.4	6.0	0.2	0.4	<0.1
		2	7.6	49.6	4.3	12.6	21.3	<0.1	0.4	4.2	<0.1	0.1	<0.1
		Avg	8.0	47.4	4.1	12.8	21.9	<0.1	0.4	5.1	<0.1	0.3	<0.1
	Exterior	1	36.1	49.2	2.7	4.5	6.4	0.2	0.1	0.5	0.2	<0.1	<0.1
		2	42.3	47.9	2.2	3.0	3.9	0.2	<0.1	0.2	0.3	<0.1	<0.1
		Avg	39.2	48.6	2.4	3.8	5.1	0.2	<0.1	0.4	0.2	<0.1	<0.1
King Star	Interior	1	11.6	53.0	4.5	10.6	17.2	0.3	0.2	2.8	<0.1	<0.1	<0.1
		2	20.4	48.0	3.4	9.3	15.2	0.3	0.3	3.0	0.1	<0.1	<0.1
		Avg	16.0	50.5	3.9	9.9	16.2	0.3	0.2	2.9	<0.1	<0.1	<0.1
	Exterior	1	26.8	50.8	3.2	7.0	10.3	0.3	0.2	1.3	0.2	<0.1	<0.1
		2	28.0	48.3	2.9	7.0	11.0	0.5	0.3	1.7	0.2	<0.1	<0.1
©2012 Robert James		Avg	27.4	49.5	3.1	7.0	10.7	0.4	0.2	1.5	0.2	<0.1	<0.1

To better understand how and where molybdenum is found, and why we would find this element both on and in our Litto Gems and King Star sourced Chinese andesine, we turned to Mr. Fred J. Menzer of one of the world's largest molybdenum mining companies: **Climax Molybdenum**. At left you see an image of a large formation of molybdenum in quartz matrix that they sent us from the Henderson Mine in Colorado. This Mo formation follows their description of molybdenum formation: **"…Molybdenite is usually associated with quartz in quartz-moly veins".** He also sent information that molybdenum is not normally found in the basaltic rocks that is claimed to be the source for the Chinese andesine.

As always, we collect actual specimens to do our confirmation testing. At the Tucson GJX Show of 2012 we found molybdenum specimens from hydrothermal quartz veins seen at left. We also obtained specimens of Brazilian emeralds in hydrothermal quartz that contain molybdenum seen below on the next page.

The obvious question: What caused these Chinese andesine rough crystals to be covered in molybdenum and even present molybdenum inside the crystals? We believe we have found the answer….

Molybdenum crucibles are widely used in China for gemstone treatments. These are rather expensive crucibles but are widely used in the Chinese markets owing to the large deposits of molybdenum in China that make them more affordable.

Based on the responses we received from several noted PhDs who specialize in mineralogy and geology, the only way to get molybdenum ***inside*** a feldspar crystal is to artificially put it there.

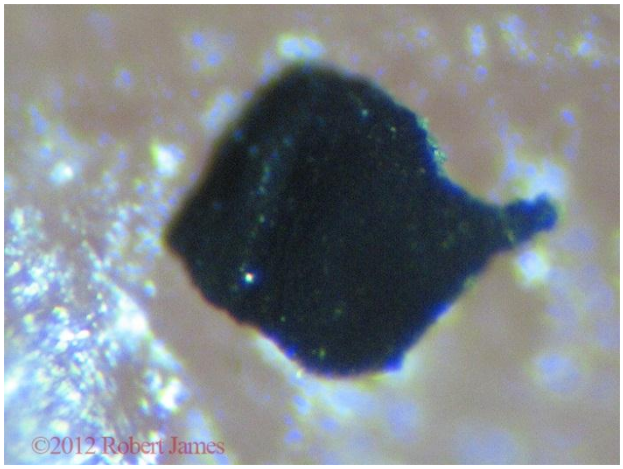
The only way to put it there is a high heat treatment.

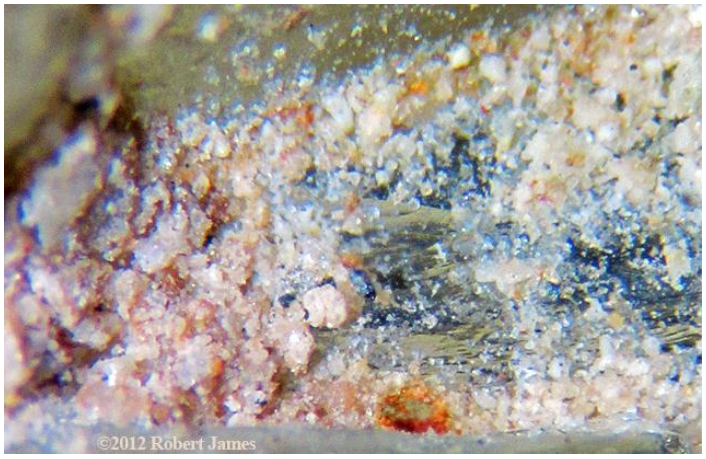
How high? We don't know. But that we found molybdenum quite literally on every surface and inside these Chinese andesine tells us that they have been subjected to some form of treatment. In 2012 this all changed….

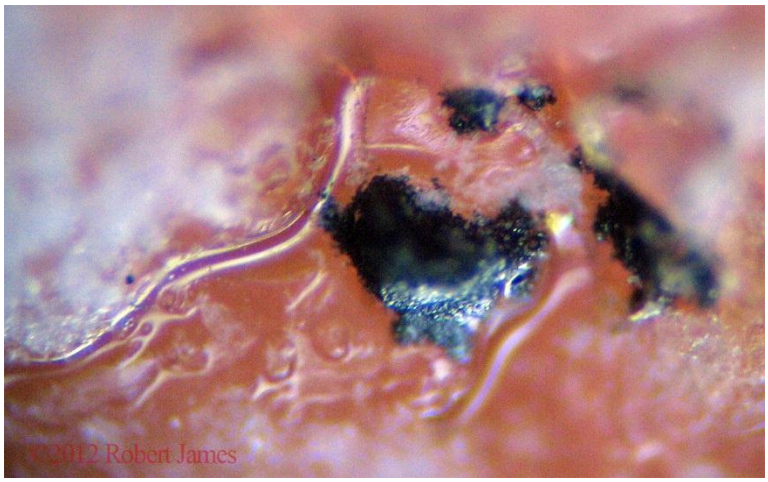
In 2012 a Discussion Panel on Chinese andesine was held at the Tucson Gem Shows. On this panel were both Dr. Abduriyim and Richard W. Hughes, and at this discussion it was advertised that Abduriyim and Hughes were going to distribute specimens of natural, untreated Chinese andesine from the Tibet and Inner Mongolian mines.

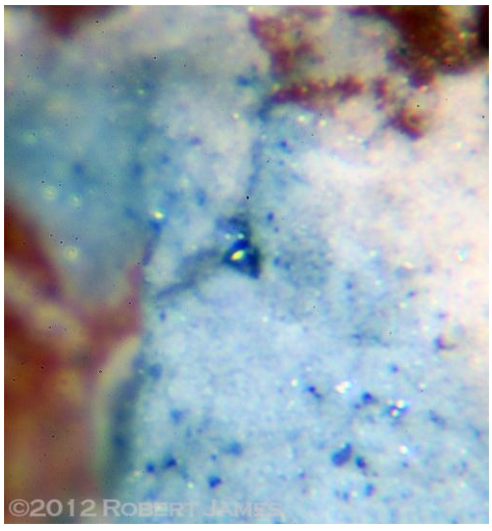
This is what we had been waiting for. These specimens could not be pushed aside as coming from an unknown source or some obscure source with questionable origin. These were straight from Abduriyim and Hughes and allowed us to finally test actual specimens that were direct from the claimed expeditions.

As outlined above, these specimens for the most part were identical to the previously tested Litto Gems and King Star specimens. The same white crusty material, fluorescent glaze, threads, etc…. But the Abduriyim/Hughes specimens presented an unusual feature not previously found: grey to black powdery substance and bluish grey metal grains. Images are below showing five separate features from both Tibet and Inner Mongolia specimens:





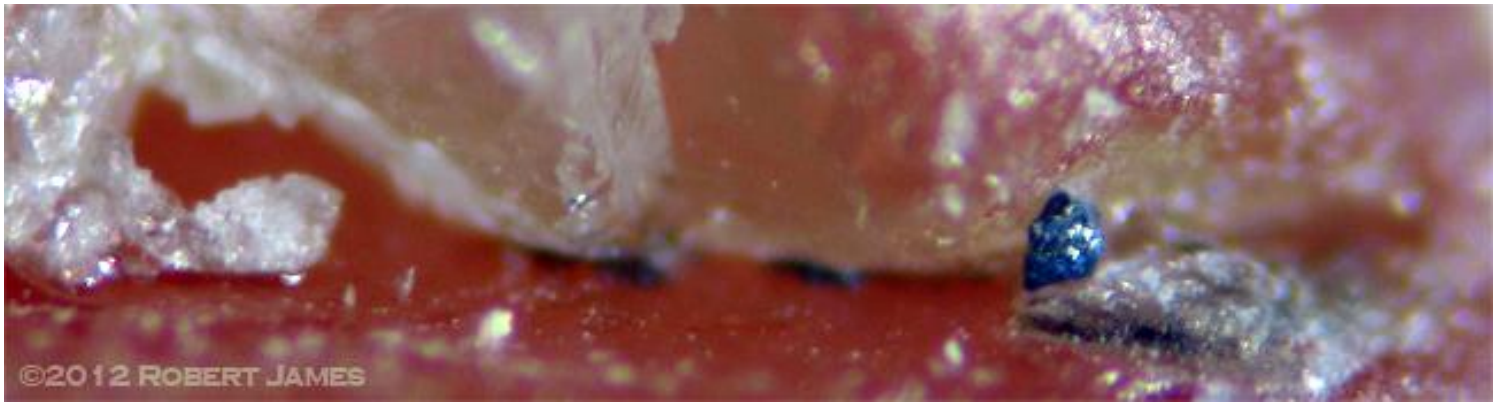


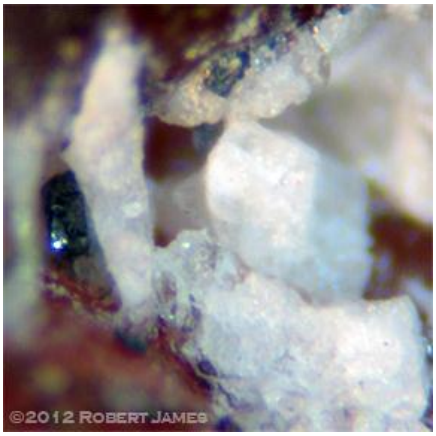


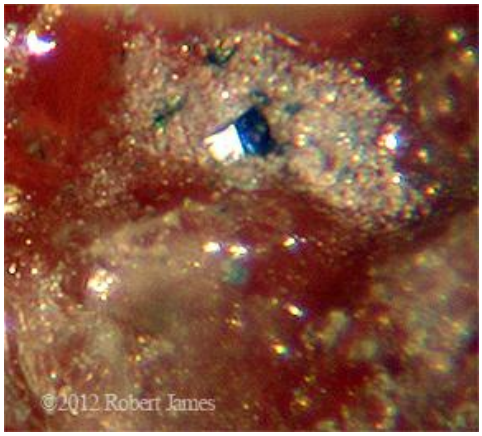
The black powder substance had a consistency that ran from quite fragile to very hard. The metal grains are ubiquitous throughout the surface of the specimens with concentrations in the grey powder material as seen at left in this image of an Abduriyim/Hughes specimen at 120x.

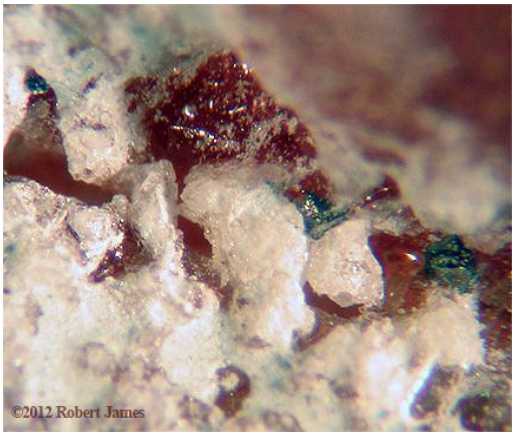
While we note the grey metal grains in the grey crusty material, we have also noted larger metal grains that appear throughout the Abduriyim/Hughes specimens. As seen below, these are larger in size and a bluish grey color that are quite unique to these specimens.

All specimens seen at left and below are from Abduriyim and Hughes from the Tucson Discussion Panel presentation.

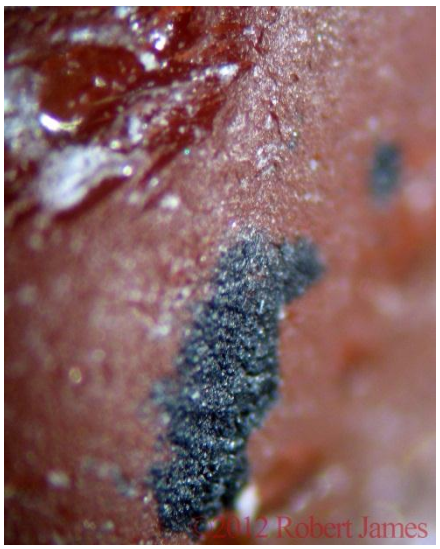








Our next step was to test this material with our Enwave Raman to ascertain any information that would be presented by this Raman scan. The results were quite surprising….

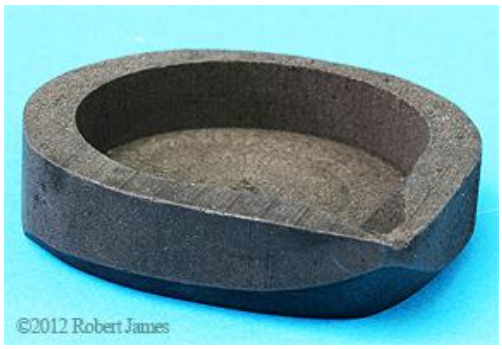


By Raman scan we found that this material you see at left is….graphite. And not just any graphite, this material is ***annealed graphite***.

We found this based on a two-step effort to confirm.

#1. The first confirmation was made using the Crystal Sleuth software search program that was developed to interpret Raman scans and compare them with known scan results. This confirmed the material as graphite, but there was a peak in our scans that initial research did not explain.

#2. According to the Journal of Chemical Physics (Vol. 53/Issue 3), research by Case Western University demonstrated that ***annealed graphite*** has a unique Raman peak at 1355 cm^{-1} that is in addition to the normal graphite Raman peak found at 1575 cm^{-1}. This allowed us to use our Enwave Raman unit to identify and separate annealed graphite that has been subjected to high heat to natural graphite that has not been annealed. The key to this confirmation was to obtain an annealed graphite crucible and a non-annealed graphite crucible to test the identification procedure. This we did.



At left you see a graphite crucible that we obtained from a supplier who provided documentation that this crucible had been annealed to 1000°C. We were able to use this crucible as our control piece for our Raman testing and evaluation for annealed graphite.

At right is a graphite crucible we obtained that ***has not been annealed***. The size and shape are not significant as the designs vary and this particular crucible that we were able to obtain as non-annealed just happens to be this shape.

By Raman scan we were able to not only confirm our research based on the above referenced Case Western University report, but also that the graphite scans that we took from the material on the surface of the Abduriyim/Hughes specimens do indeed match those of our known ***annealed graphite crucible.***

The question now remained: With the presence of annealed graphite, do we have molybdenum on our new specimens from Abduriyim and Hughes as we previously found on the Litto Gems and King Star specimens.

For that answer we turned again to FAI Materials Testing of Mariette GA for SEM EDXS testing.

The answer we received: No molybdenum on these specimens. None. In spite of 100% of the previous specimens tested having presented molybdenum, the Abduriyim/Hughes specimens had none.

Once again, the gemstones told their own story….

Below is the actual print out of the elemental analysis of the specimens from Abduriyim/Hughes. As you will note, suddenly none of the specimens have any molybdenum and all four specimens (representing two mines 2000 miles apart) present the exact same levels of….sulfur. If all of these specimens from all of these claimed dealers were all from the same natural untreated origin as they claim…how could we suddenly have no molybdenum and now have a uniform composition of sulfur along with annealed graphite? And why sulfur? We believe we know the answer….

Table 1: Elemental Composition for Four Samples (Wt. %)

Sample	Run	C	O	Na	Mg	Al	Si	S	Cl	K	Ca	Ti	Fe	Mo
Tibet	Average	19.9	44.9	3.2	<0.1	9.5	17.8	0.1	0.1	0.5	3.8	<0.1	0.2	<0.1
Tibet	Average	42.9	43.9	2.2	<0.1	4.1	6.0	0.1	0.2	0.1	0.6	<0.1	0.1	<0.1
Inner Mongolian	Average	28.9	51.7	2.2	0.2	5.6	9.4	0.1	0.2	0.3	1.0	<0.1	0.5	<0.1
Inner Mongolian	Average	23.7	52.2	2.5	<0.1	7.0	12.1	0.1	0.1	0.3	1.6	<0.1	0.3	<0.1

Based on the presence of annealed graphite, we anticipated the possibility that we would have sulfur instead of molybdenum and here is why…

As shown below, the Chinese produce graphite crucibles that are much cheaper to use than molybdenum crucibles. Graphite crucibles are also made from….sulfur, as listed on the manufacturer's composition below. If the Chinese suddenly stopped using the more expensive molybdenum crucibles and switched to the cheaper graphite crucible, we would expect to find graphite and sulfur on the specimens, and no longer find molybdenum. Not only did we find sulfur, but we found it in the exact same levels on the Tibet andesine as on the Inner Mongolian andesine. These two claimed mines are 2000 miles apart and yet we find the same levels of sulfur on all?

See larger image: graphie crucible

graphie crucible

FOB Price: Get Latest Price
Port: Tianjin
Minimum Order Quantity: 1 Metric Ton/Metric Tons
Supply Ability: 300 Metric Ton/Metric Tons per Month
Payment Terms: L/C,T/T

Mr. Jacky Niu
Offline

Verified Company
Topfly Material Co., Ltd.
[Beijing, China (Mainland)]
A&V Checked
No substantiated complaints in last 90 days
Contact Details

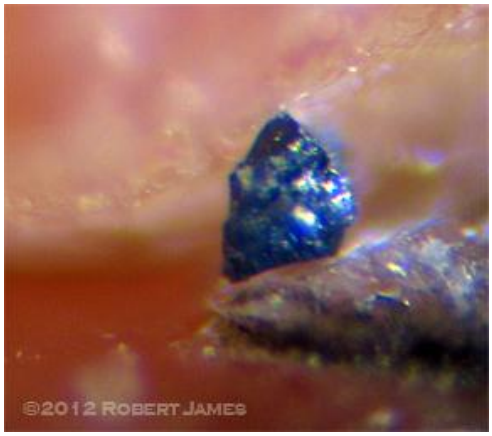
Place of Origin: Hebei China (Mainland)
Chemical Composition: Carbon, Sulfur, Ash

So prior to 2011, 100% of the Chinese andesine that we tested had molybdenum present on all surfaces and the interiors that we had tested by two labs, using two sets of specimens and two different testing methods.

As of the 2012 Discussion Panel by Abduriyim and Hughes where new specimens were handed out claiming to be both the Tibet and Inner Mongolian andesine, we suddenly have a total absence of molybdenum and instead have a uniform presence of annealed graphite and sulfur on the surfaces of all of the specimens.

The only plausible explanation of this is that the cookers of this material changed the type of crucible being used. The other issue is that the specimens handed out personally by Abduriyim and Hughes clearly indicates that they are indeed treated and not natural, untreated as claimed. This makes the whole issue of Tibet andesine become a question now of fraud. Specifically who? We don't know. But what? We believe we do know.

But there are two more questions about the surface relics...



Our Raman scans of the bluish grey metal grains presented a very unusual Raman photoluminescence reaction until we obtained a specific mineral specimen from David H. Garske, Ph.D. Mineralogist from Tucson AZ.

The mineral: Chalcocite. Copper sulfide. It is either an important ore of copper that occurs near copper mines, or ***it can be created in a lab by heating sulfur in the presence of copper.***

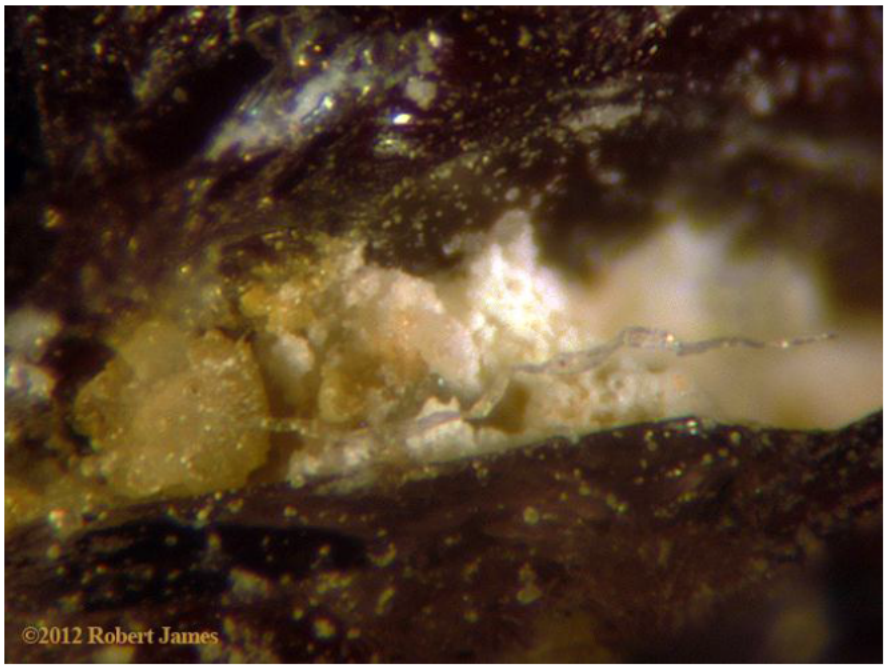
To double check our test results we also obtained chalcocite specimens from the Baltic Mine, Houghton Co. Michigan, and a specimen from the deposits in Cumberland, England. All matched 100% to our Raman scan of the bluish metal grains we found in the Abduriyim/Hughes specimens as shown at left.

Glassy Glaze and the Intact Threads

The questions continue to pour in regarding how can we have threads that are in basically good condition encased in what appears to be a glazed glassy material? As you can see from the Abduriyim/Hughes specimen at left, and the Litto Gem specimen below, all of these specimens have threads encased in what appears to be a glassy material. If the glass were molten, how did these threads survive?

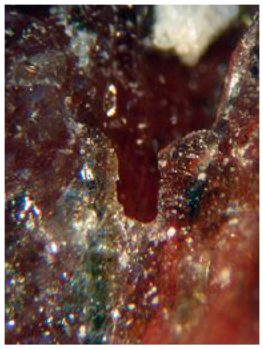
We believe we have found the answer based on information from our good friends at Mindat.org and a myriad of other scientists who read this report and help out.

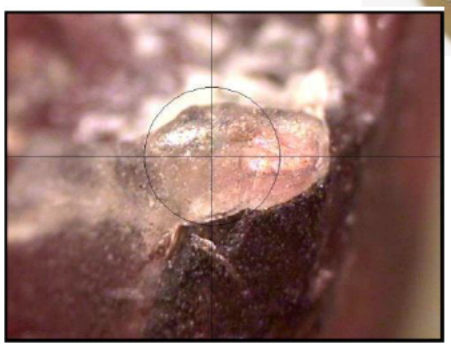
That answer….water glass! Sodium Silicate.



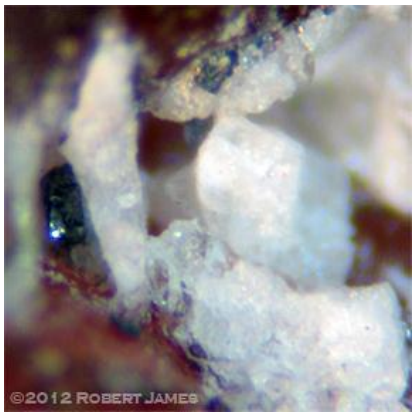
By Raman we have confirmed that this sodium silicate liquid that has so many uses may well be the culprit somehow in this unusual feature that presents in all of these specimens.

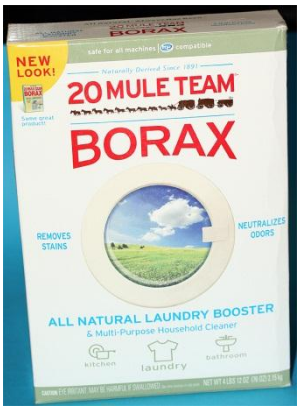
Indeed, when we compared the glass filling and surface coating of the known glass filled corundum it matches the glassy glaze material of the Chinese andesine. You can see the glassy glaze on the ruby at left and the green sapphire below.





By elemental analysis and Raman scan, the glassy glaze on all of the Chinese andesine matches almost identically to the glass filler in the corundum. Why? How? At this point we don't know. But we are working on this. We will continue to work on that in a future issue.





Beyond that is the white crusty material that as yet has no confirmed answer. Our initial research on this: Borax. In his book on ruby heating and treatment Ted Themelis outlined the use of borax in the treatment process. It may well be that we have the same material here. One thing is for sure, there is a lot of sodium showing up on these specimens. Water glass (sodium silicate) and/or Borax (sodium borate) could certainly provide a lot of answers and perhaps prove to be the source of the sodium that caused this Mexican feldspar from the Casa Grande mine to be lowered into the andesine range in the Na/Ca scale of feldspar to become Chinese andesine. But we continue with that study.

Conclusion:

The importance of this Chinese andesine issue is twofold. First, it constitutes a US$150+ million dollar fraud perpetrated on consumers. Second, andesine is simply one of many gemstones being treated. If we can find the answer to the andesine issue we stand a good chance of finding answers for other stones. If we fail to find answers in the andesine issue and the Chinese perpetrators get away with this fraud, then the colored gemstone industry as we know it could well be lost forever. It is that serious and we put the Chinese gemstone industry on notice that we are using a fine tooth comb to go over everything you produce and will not stand down….ever…..in our efforts.

The Chinese who are involved with this andesine fraud have had years, literally years, to create these bogus Tibet and Inner Mongolian andesine mine locations. But that does not excuse the lackadaisical work performed by the members of these expeditions who visited and proclaimed the mines real. Anyone simply going out there and digging up a stone and declaring the mines to be real is either very naïve regarding what gemstone mines look like, or else they are part of the fraud. We don't know which side any of the expedition members are on regarding this, but based on what we have here now, every single person who claimed to have been on these expeditions must be on one side or the other, because all of the specimens show treatment. 100% of these specimens from Abduriyim/Hughes, Litto Gems and King Star sources show relics of crucibles.

Common sense and gemstone experience says that if you put a rough gemstone in a crucible and heat it, the crucible is going to leave something behind on the rough stone. If you don't sell the rough no one will find that relic. We believe that is why no rough was or is available on the market. We know that a natural gemstone is not going to have threads glazed onto the surface unless it has been subjected to some type of treatment. We also know that one will not find molybdenum fused across the surface of feldspars without it having been put there by some type of treatment. Same for annealed graphite, sulfur and copper sulfide. Common sense mixed in with some science. We don't know the precise treatment, but that was not the original question. The original question was simply whether or not treatments have been done to this Chinese andesine? The answer to that has been clearly given as: Yes! The more pressing question now is whether there are verifiable mines in Tibet and Inner Mongolia producing natural andesine gemstones based on specimens presented by those who published expedition reports?

Given the evidence presented by the actual gemstone specimens, we conclude that the presence of molybdenum on the surface and inside the crystal interior of these gemstones is a relic of a crucible used during treatment of the Chinese andesine.

Given the evidence presented by the actual gemstone specimens, we conclude that the unique combination and presence of annealed graphite, sulfur and copper sulfide on these specimens are relics of a crucible used during treatment of these Chinese andesines.

It is our finding that the evidence, in the form of gemstone specimens presented by the expedition members, does not support their claims of the existence of natural Tibet or Inner Mongolian andesine mines.

The evidence clearly points to these specimens from the Abduriyim and Hughes expeditions having been subjected to artificial gemstone treatment(s).

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